Colorado Office of Emergency Management
Hazard Mitigation and Risk Assessment Internet Mapping Tool
User Documentation
July, 2003

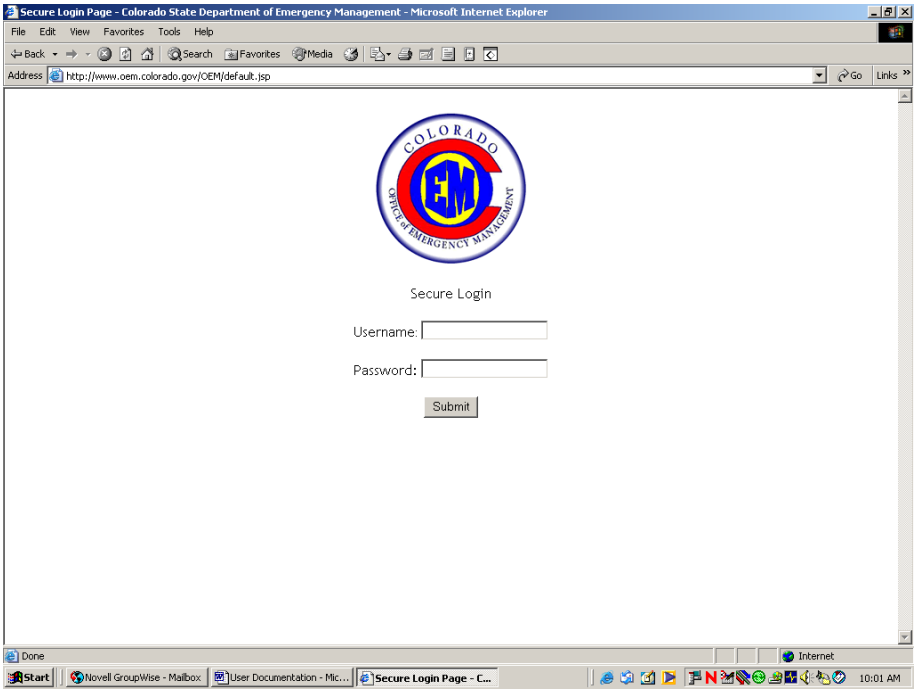
This document provides an overview of some general capabilities available through the Hazard Mitigation and Risk Assessment Internet Mapping Tool available through the Colorado Office of Emergency Management. The tool was designed to provide basic mapping display and query capabilities through an Internet web browser, to support the hazard identification and risk assessment planning process associated with the Pre-Disaster Mitigation program. The data displayed is presented as "best available" data compiled from federal and state databases. In some cases more than one data source is portrayed for a specific theme. An extensive data dictionary is supplied at the end of this document, describing source information for the themes presented. In many cases, local government GIS databases contain more positionally accurate and complete data than is presented here. In these cases we encourage the user to seek out and use this local data and information. Many areas of the state do not have the resources or GIS programs to develop complete and accurate source information for these or other GIS themes, and therefore these federal and state sources of information represent the best available starting point for mapping and GIS support for natural hazards risk assessment and mitigation planning.

We will now step through how to use the features of this Internet mapping tool.

Starting the application:

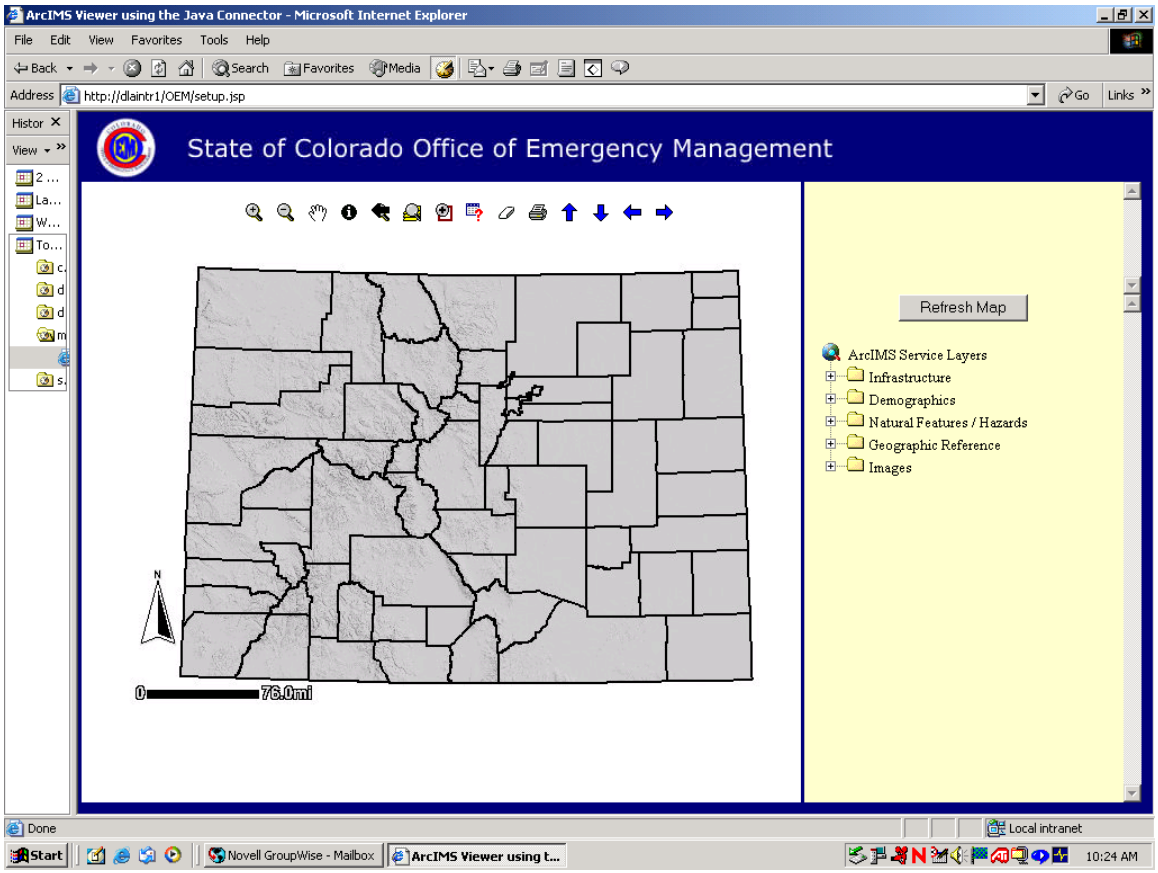
You must use Internet Explorer (IE) to access this application. Using Netscape or other browsers will not give consistent results. This is currently a limitation of the vendor software that we are using (ESRI's ArcIMS). ***Start IE.***

The url (or web address) to this application is http://www.oem.colorado.gov/OEM/default.jsp Go to this address and you will see the following screen:



The Username and Password can be obtained by contacting Marv Koleis at marv.koleis@state.co.us. The next screen that you will see will portray Colorado terrain (as a

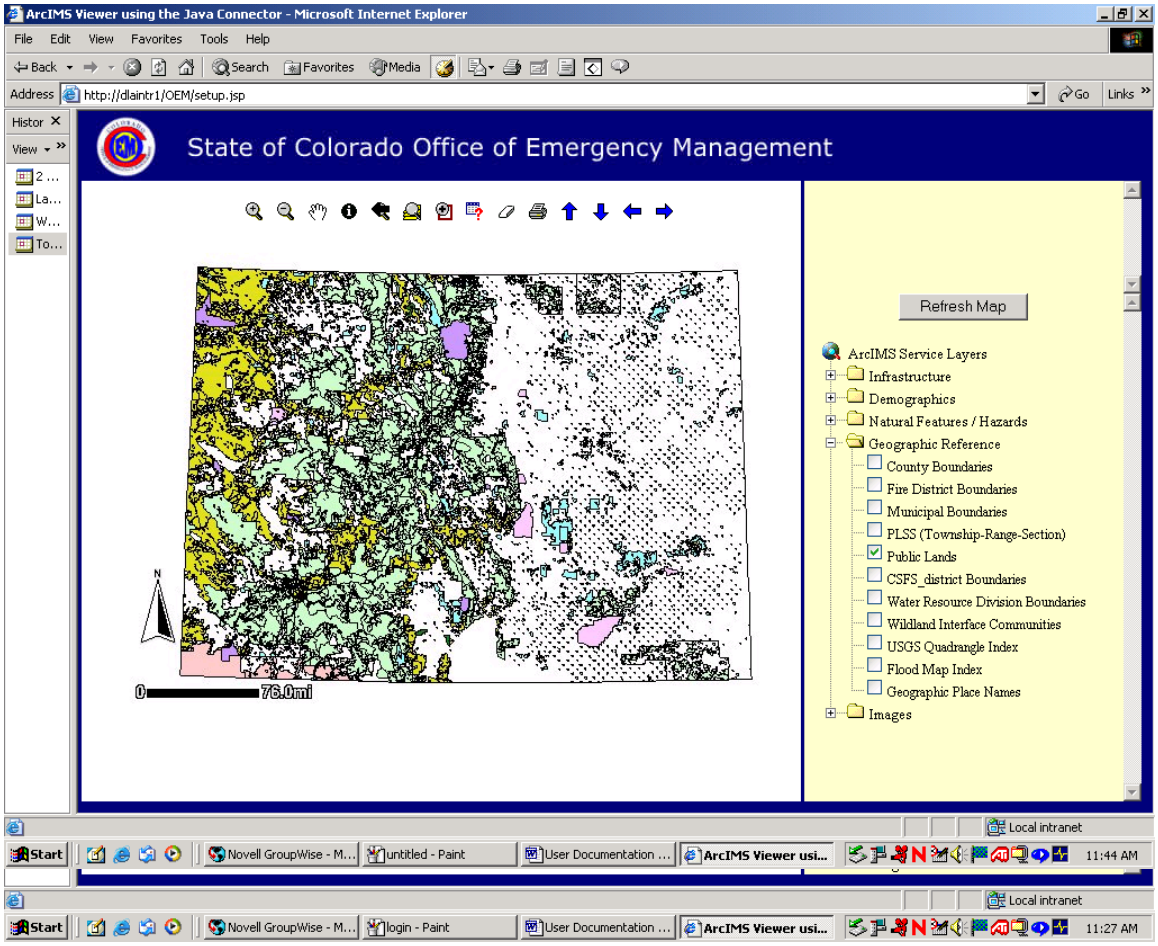
shaded relief image) and the County Boundaries of Colorado (see below).



There are two areas of the screen that you can interact with. The first is a Layer List on the right side of the screen. This area will allow the user to pick different layers of data (or themes) to portray. The second is a series of Function Buttons at the top of the map area that will allow the user to zoom in and out, pan around the map, perform queries on the map or database and print a map. We will go through these two areas one at a time, starting with the Layer List.

The Layer List

As displayed in the image above, we have categorized all of the data themes presented in five separate categories. These categories are Infrastructure, Demographics, Natural Features/Hazards, Geographic Reference and Images. The ***Refresh Map*** button *must* be pressed after every change in selection from the Layer List, in order for the new themes to be portrayed in the Map Area. The following two images will illustrate how this works. The first image shows that the terrain and county boundaries themes are checked in the layer list and are depicted in the map area. County boundaries are found under the Geographic Reference category and the terrain theme is found under the Natural Features/Hazards category (although that category heading is not visible in the image).



We will turn off the County Boundaries theme and the Terrain theme and then turn on the Public Lands theme. Then we will click the ***Refresh Map*** button. The following image will display the result. If you are following along on the actual website you will notice that the Layer List has closed and is only showing the five main categories. This happens every time that you push the ***Refresh Map*** button. If you need to see the themes under the individual categories, simply click on the Categories that you would like to see the themes for again (as we have done in this example to show that the Public Lands theme has been turned on).

This application can display over forty different themes. It is not intended that all of the themes be turned on at the same time. Indeed, if many themes are turned on simultaneously, the map becomes very difficult to read and renders little useful information. Our intention is that the user will find appropriate combinations of themes that illuminate relationships between Natural Hazards and Infrastructure and Populations, thereby helping refine or depict aspects of a risk assessment. Trial and error and using some discretion will guide the user to how many themes, and in what combinations will work.

This application has also been designed to only display certain themes within scale ranges. We have set display ranges such that certain themes will only turn on when the user is "zoomed in" appropriately. One example would be Highways, Major Roads and

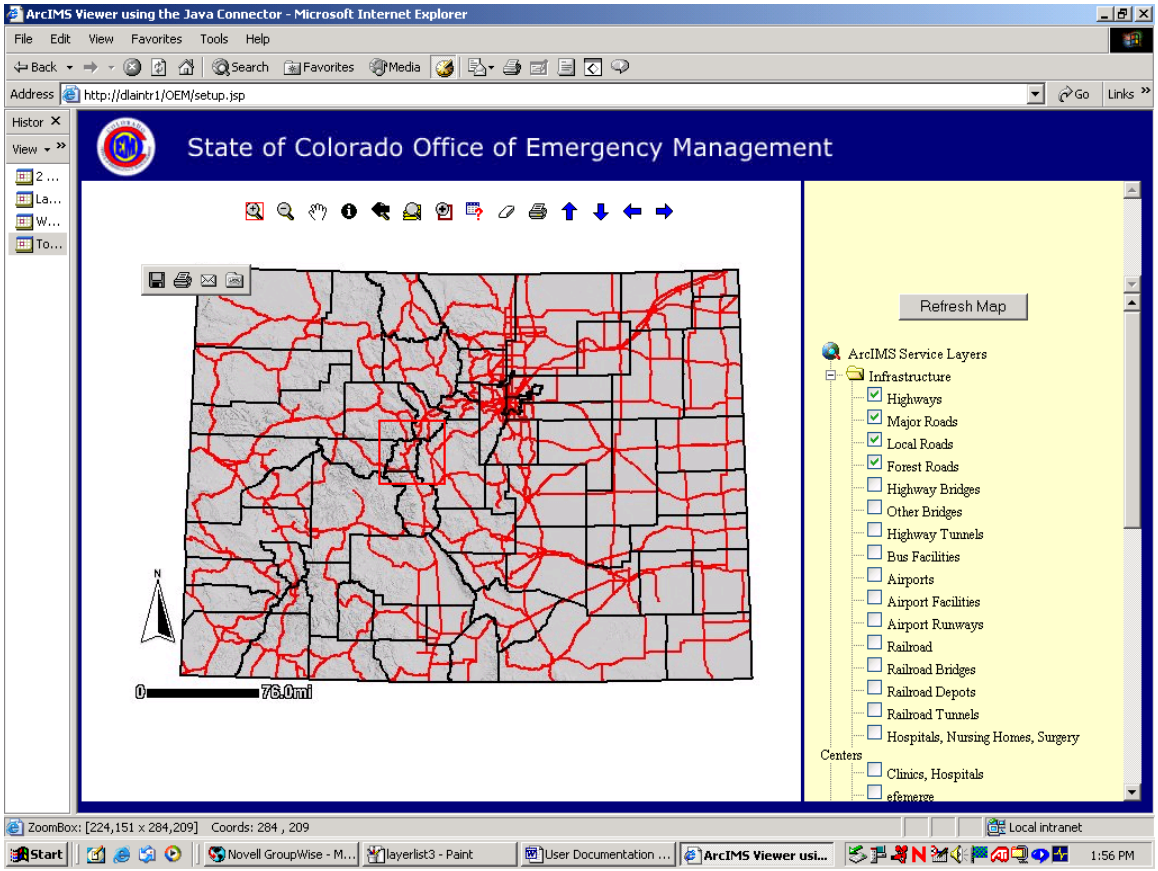
Local Roads. Highways will turn on at any scale, major roads will turn on when the user is "zoomed in" to a regional level and local roads will turn on when zoomed in to a locality. Conversely some layers will not display when "zoomed in" too close. An example of this is terrain. As the user zooms in, the terrain image begins to deteriorate in quality and the user begins to see the edges of each pixel in the image. At this point the image is of very little use, and so we have chosen not to display it.

Function Buttons

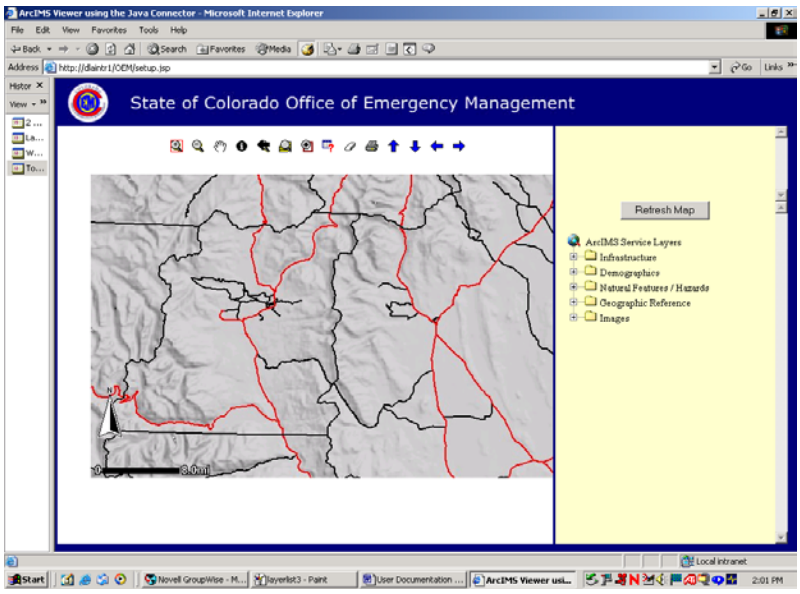
The function buttons at the top of the map area provide some basic capabilities to resize and move around the map, as well as query themes and print maps. There are fifteen buttons that will perform different functions for you. This section will give a general description of their use. A short description of each button can be seen by hovering the mouse over a button and then looking in the lower left of the Internet Explorer window.

Zooming and Panning

Nine of the fifteen buttons perform *Zoom and Pan* functions. We'll start with the "Zoom" buttons. We will start with a map extent depicting the entire state. We've turned on the Highways and Road themes in addition to the terrain and county boundary themes. But only the Highways are being displayed (this is because the other roads

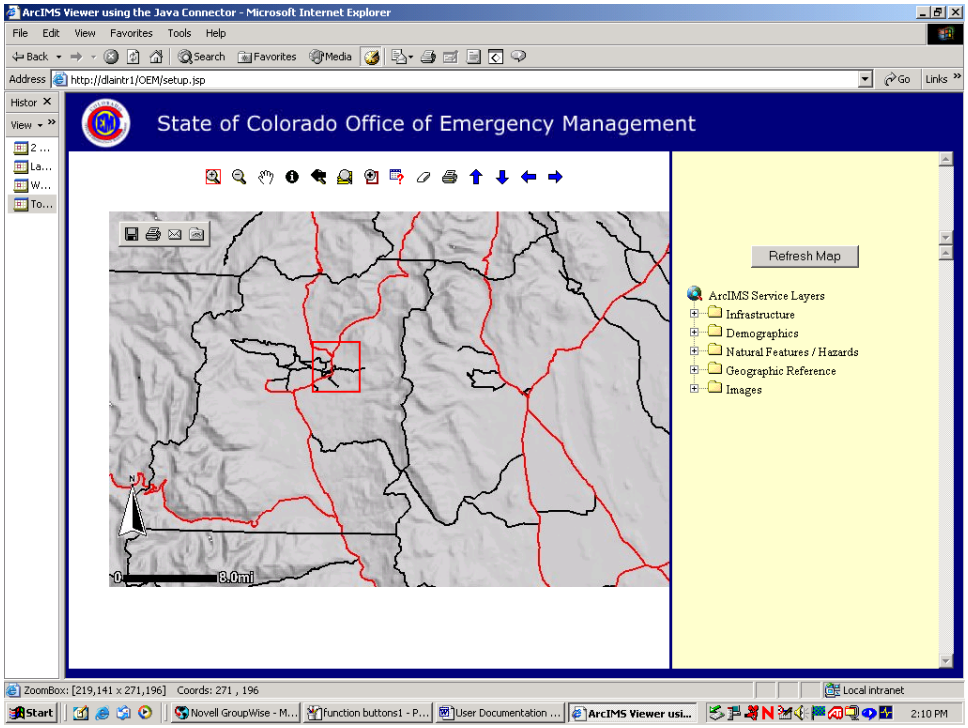


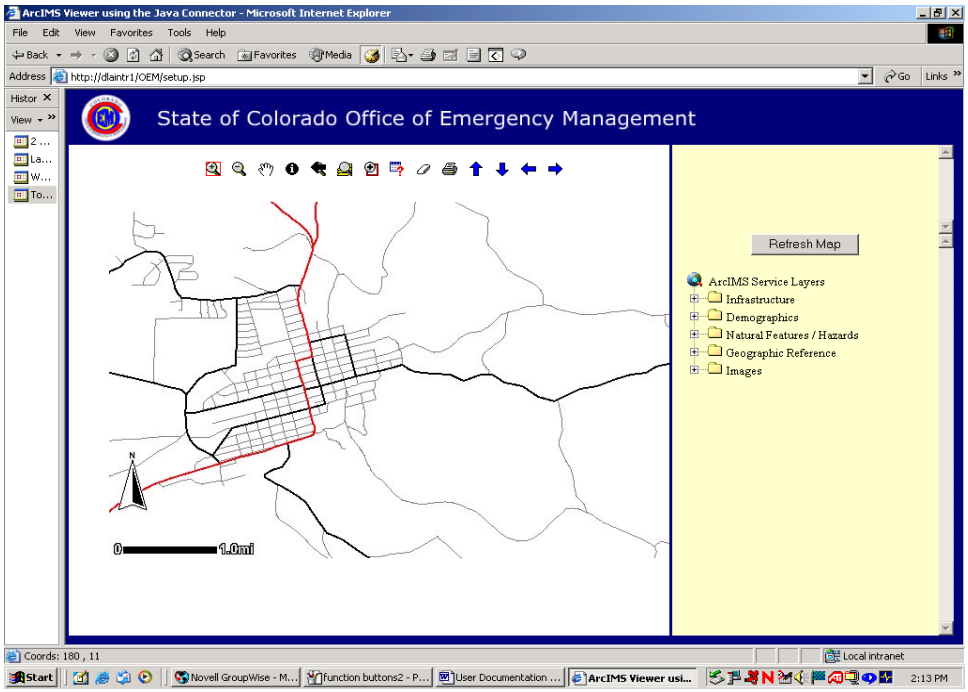
would clutter the map at this scale and make the map difficult to read. Notice that the first button (the left most button) has a red box around it. This indicates that it is the current active button for use.



This button depicts a magnifying glass with a plus sign in it. It is the "zoom in" button. By moving into the map area the user can click and hold down the left mouse button and draw a box around the area of the state that the user would like to "zoom in" to. In the above image we have drawn a box generally around the Lake County area (It's a little difficult to see because the box is red, the same color as the highways). The next image shows the result displayed in the map area. In addition to the highways, the major roads are now displayed.

Zooming in further (to Leadville) will display the local roads also (See next two images).





The second button, a magnifying glass with a minus sign in it, will perform the "zoom out" function. It is very similar to the "zoom in" button. If you make a big box it will "zoom out" a little, if you make a small box it will zoom out a lot. Finding the area and mapsize that you want will take some trial and error. The fifth and sixth buttons are "Zoom to previous Extent" and "Zoom to Full Extent" respectively. Simply click them. These buttons provide quick shortcuts when you either want to start over or go back to the last step that you took.

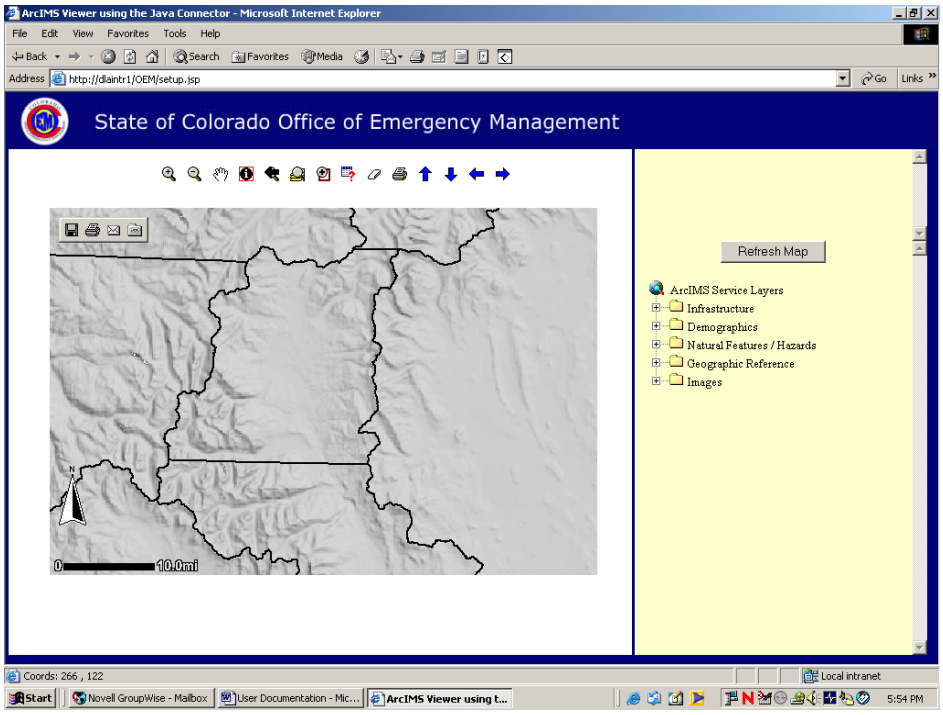
The "zoom in" and "zoom out" buttons will not work by just moving your mouse onto the map and clicking. This returns a blank screen. If this should happen click the fifth button from the left "Zoom to previous Extent". This will put you back where you were. Clicking the sixth button "Zoom to Full Extent" will also work. This will let you start over with a map of the entire state.

Panning allows you to move the view around to areas adjacent to where you are, that are currently not shown, without changing the map scale that you are currently set at. Panning is handled by the "hand" button or by any of the four blue arrows. When using the hand, simply click on the button, then move to the map area, put the hand on the map and drag it. The entire map will drag in the direction that you move. If you want to see an area that is Northeast of the current window view, then put the hand somewhere in the northeast quadrant of the map and drag to the southwest. Alternatively, you can use the four blue arrows. These buttons will Pan in set increments in any of the four cardinal directions that you pick.

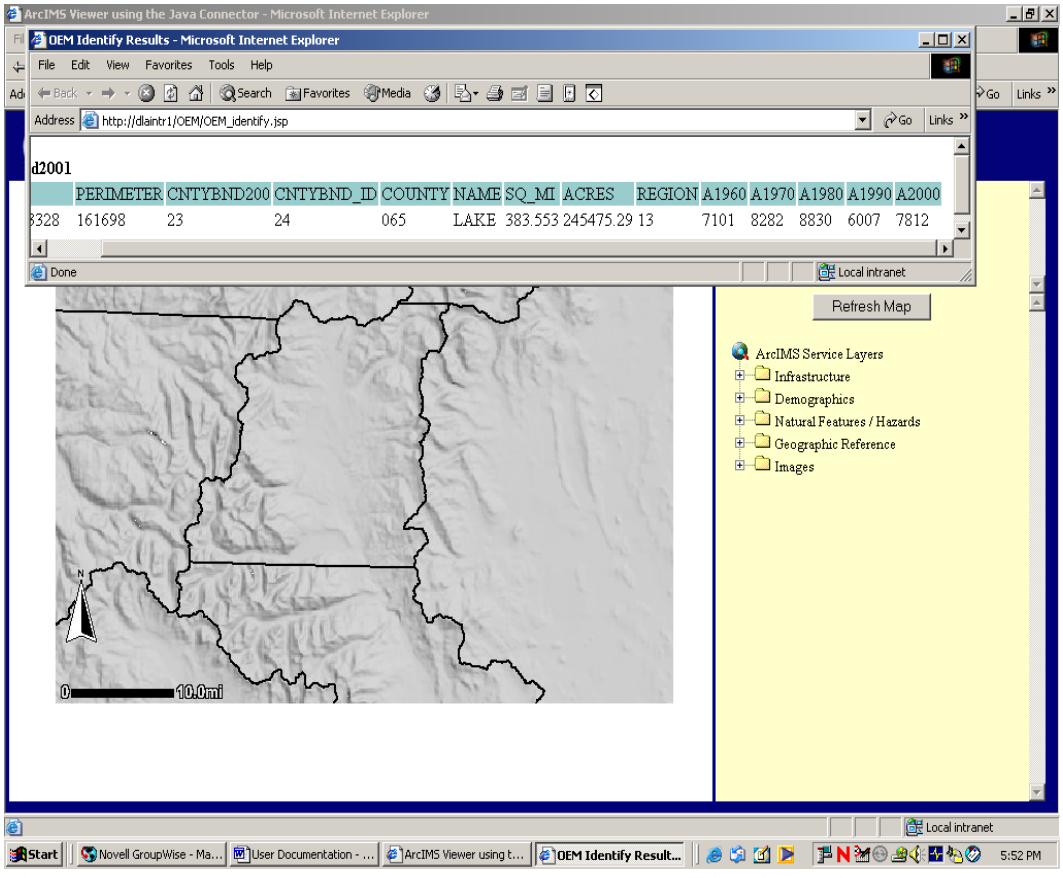
Other Function Tools

Other function tools include the Identify Tool, Query Tool, Zoom to Specified Area Tool, Print Tool, Clear Selected Features Tool and a Legend Tool. We'll explain these one by one.

The **Identify Tool** is the fourth button in the Function Tools area. This identify button will display all the database elements for all of the themes that are currently active. The pictures below illustrate its functionality. The user should first click the Identify button on the button bar. Then move the mouse over the area that you want to identify and click the left mouse button.

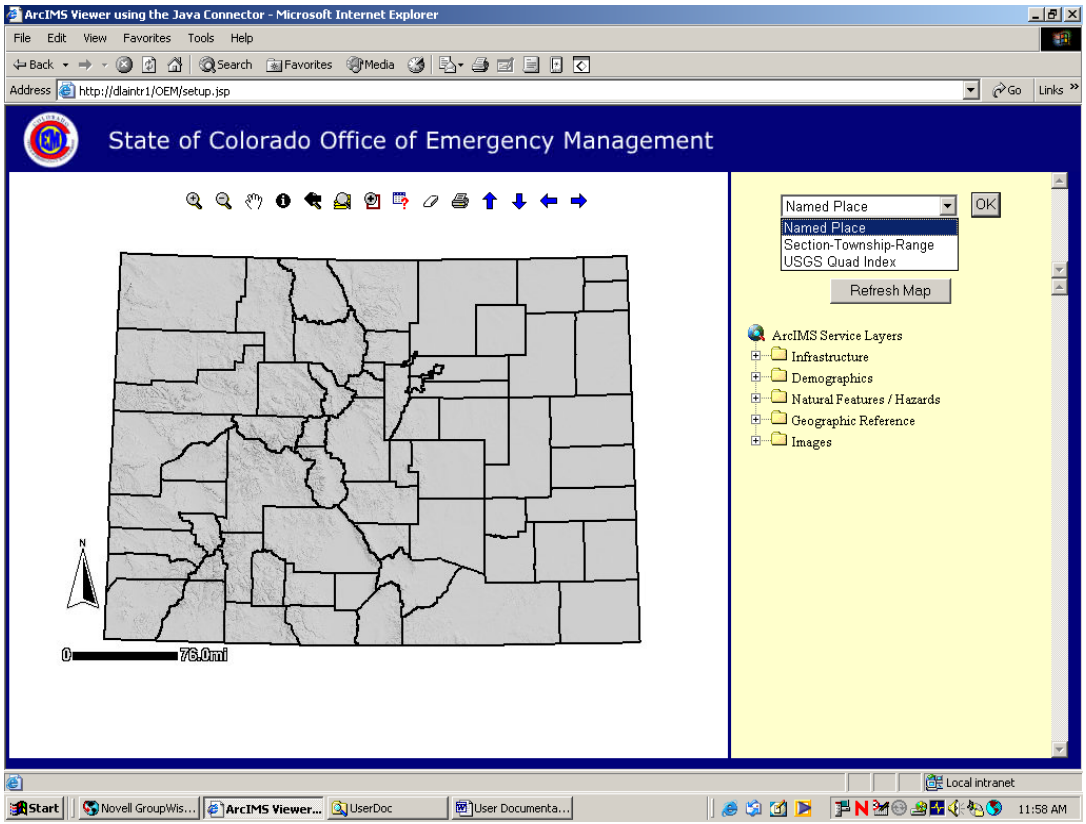


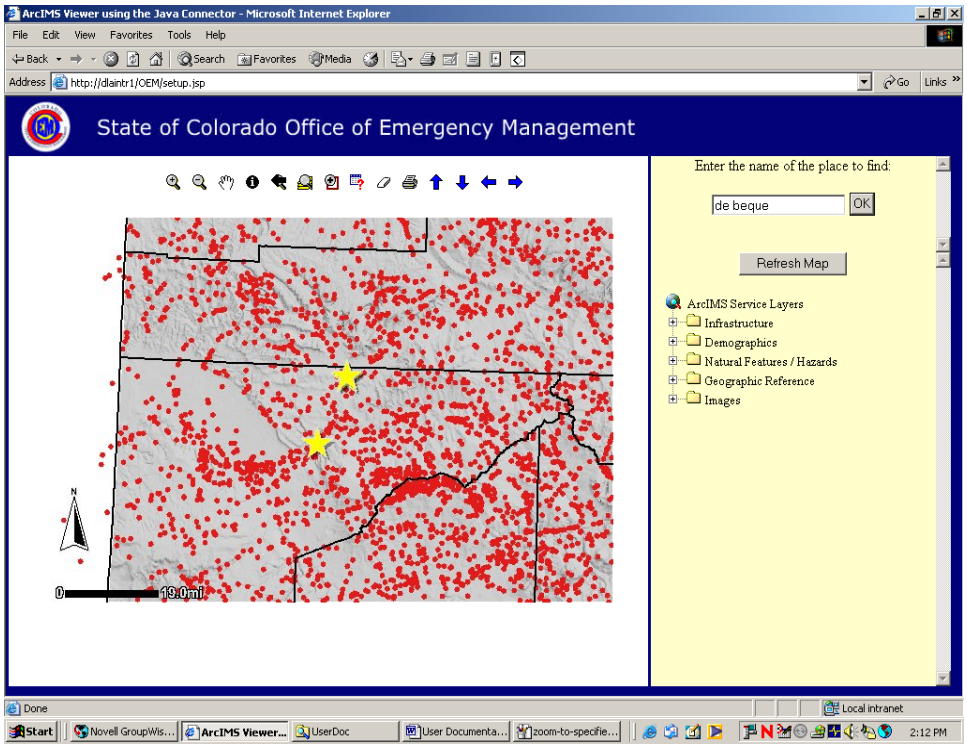
A popup window titled *Identify Results* will open and display the database fields for each theme or layer. No information will be displayed for images like the terrain image or the USGS topographic maps. All database fields are currently being displayed. This can be cumbersome to sort through and understand. We will try to improve this tool by eliminating unnecessary fields and providing documentation on the remaining fields.



The Zoom to Specified Area Tool

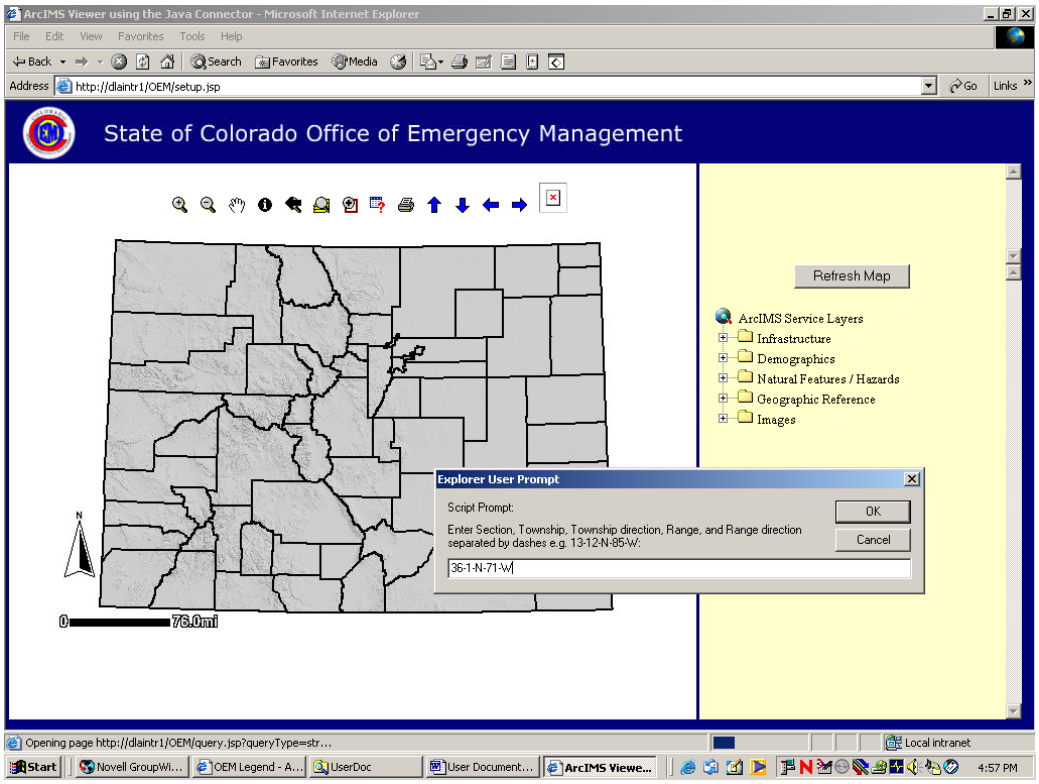
Unlike many of the other tools, which have the user graphically search for something, this tool allows the user to zoom into an area by giving some textual information. This information can be of three types: a named place, a section, township and range of the Public Land Survey System or a USGS topographic quadrangle name. When the user clicks the Zoom to Specified Area Tool a selection box opens in the Layer List section of the screen allowing the user to pick one of the three above mentioned types of areas. Depending upon the users choice, a dialog box will appear to capture the user input. The next picture demonstrates finding a named place. Two different matches were found to the search for places named De Beque. The theme that is being queried is the Geographic Place Names, under the Geographic Reference



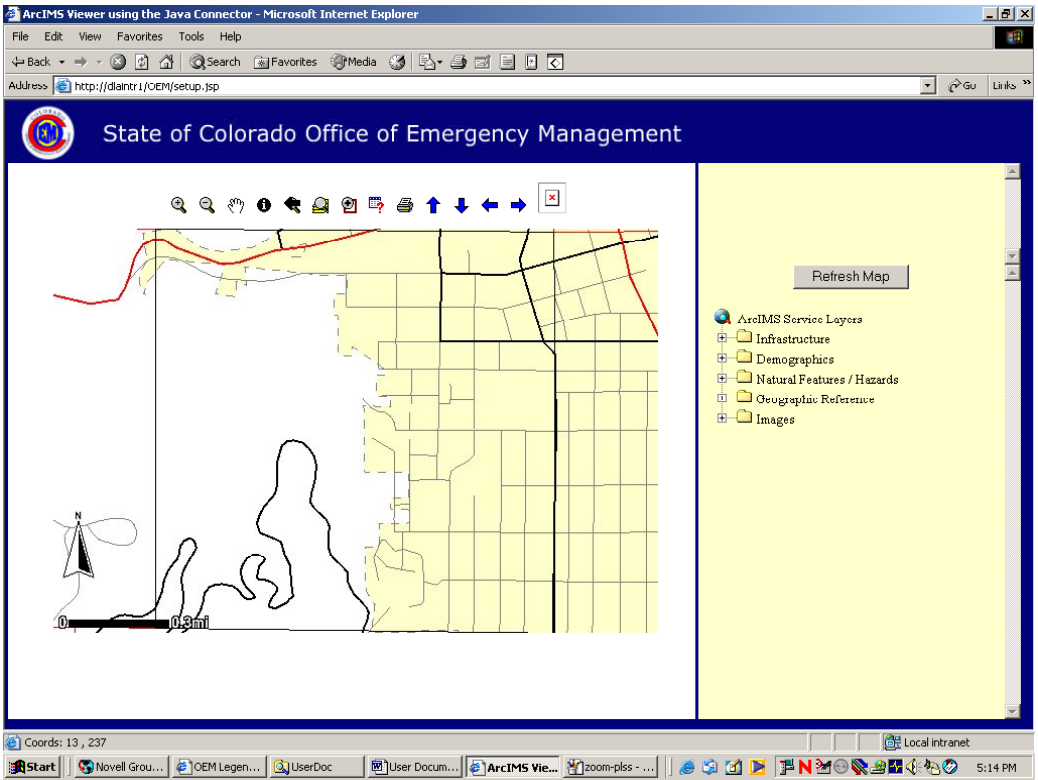


Layer tab. This tool was designed to be case insensitive when the user types in a name.

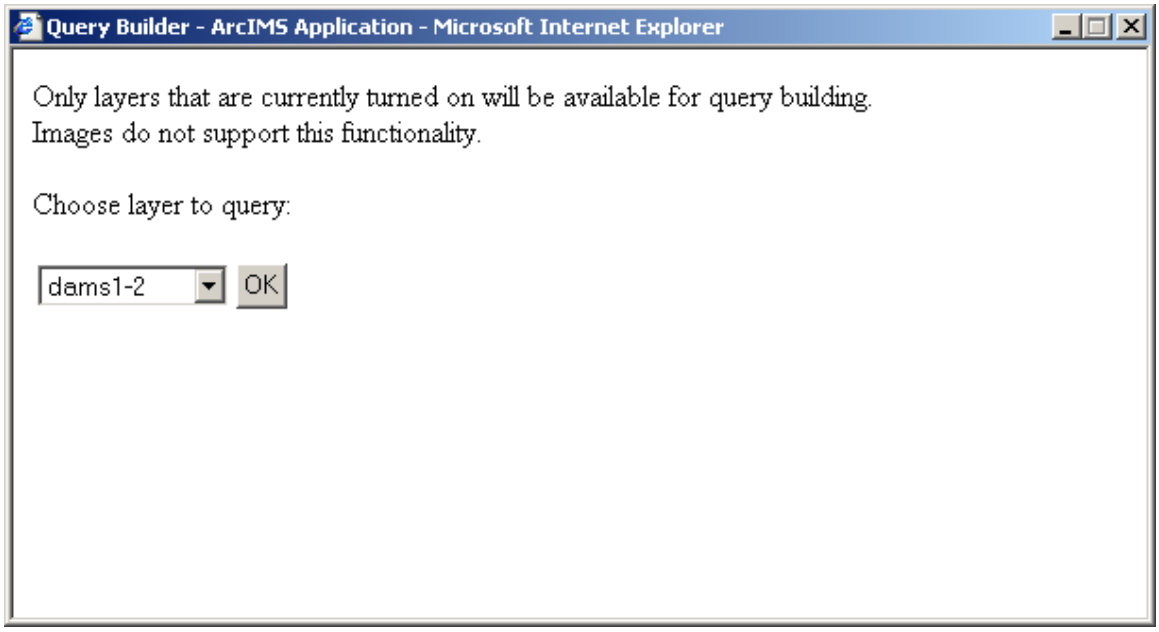
Using the Section-Township-Range option of the Zoom to Specified Area Tool will bring forward a popup menu that will prompt you for the correct section, township and range. The figure below illustrates the correct entry. All entries are separated by dashes.



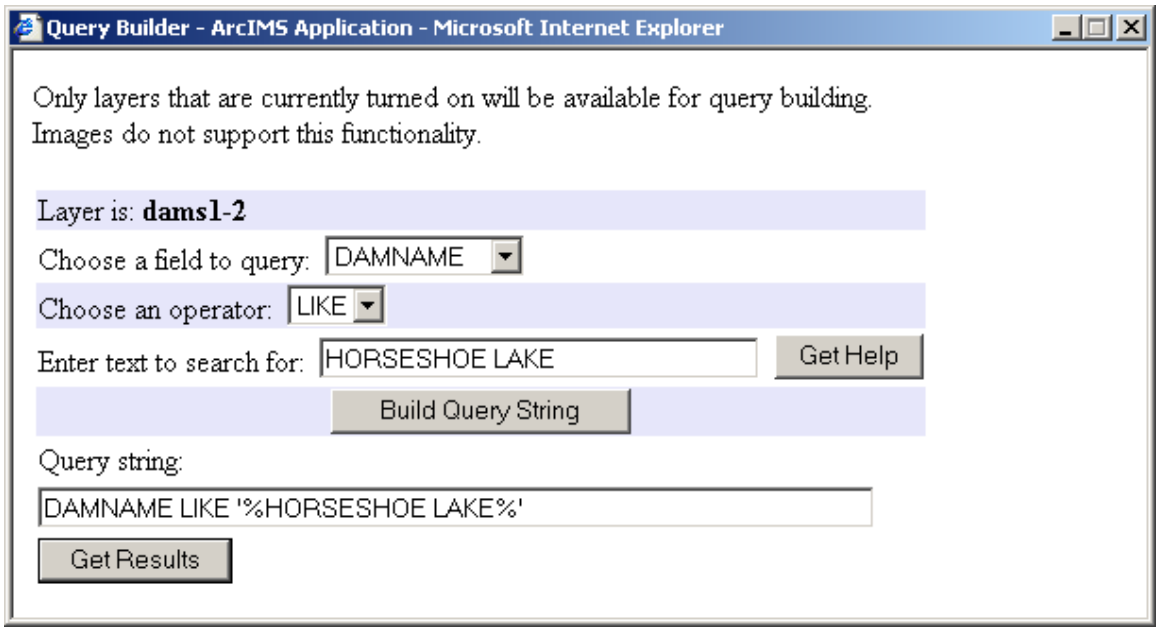
This particular example is in Boulder County, near Baseline Ave. The resulting screen will zoom in on that particular section as shown below.



The **Query Builder** tool allows you to perform a query on the attribute table of a specified layer. This allows you to select features like roads and streams based on their name. Before clicking on this tool you will need to have the layers you wish to query displayed on your map. A dialog window will display when you click on the Query Builder tool. The first step is to choose the layer you want to query from a drop down list. At this time the actual name of the GIS data is displayed in this list, which are similar to but not the same as the layers in the layer list. For example if you want to find a Class I or II dam you will need to display the 'dams1-2' theme in the dropdown list and hit the 'OK' button.

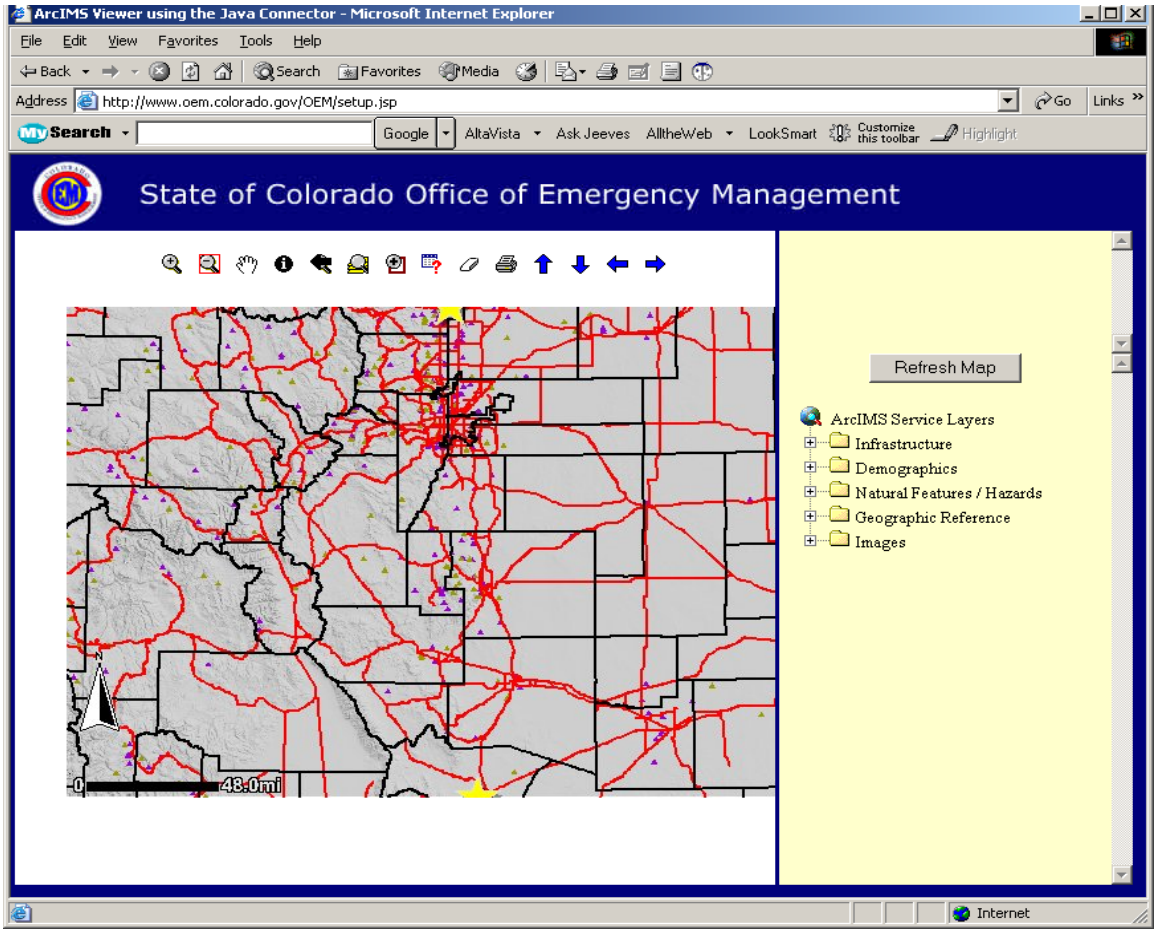


A new dialog window will display that allows you to enter details on your search. In this example we want the field to query to be 'DAMNAME', the operator to be 'LIKE' and the search text to be 'HORSESHOE LAKE.'



Click the 'Build Query String' button and your query will be built for you in the box below. Click 'Get Results' to send your query and see the results on the map.

With this example two features are located and highlighted with a large yellow star. Use the pan/zoom tools to zoom into the area of specific interest.

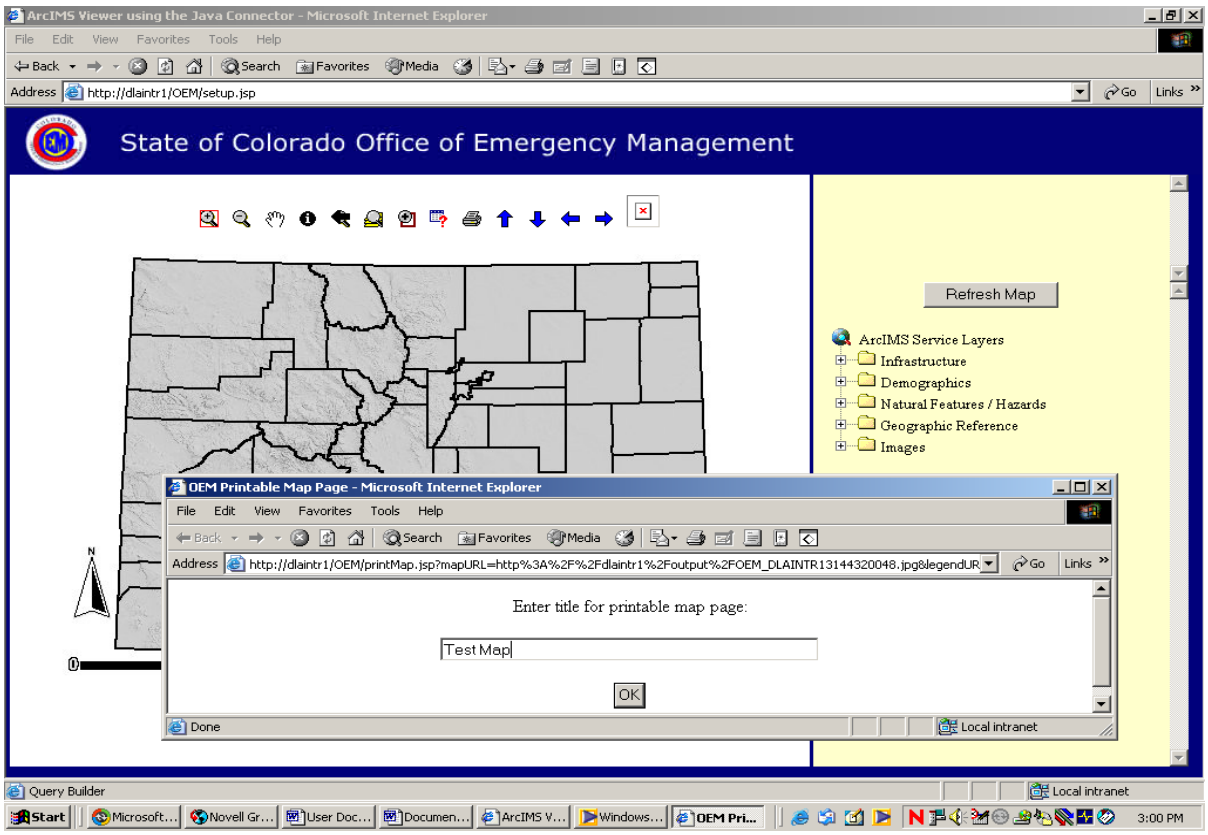


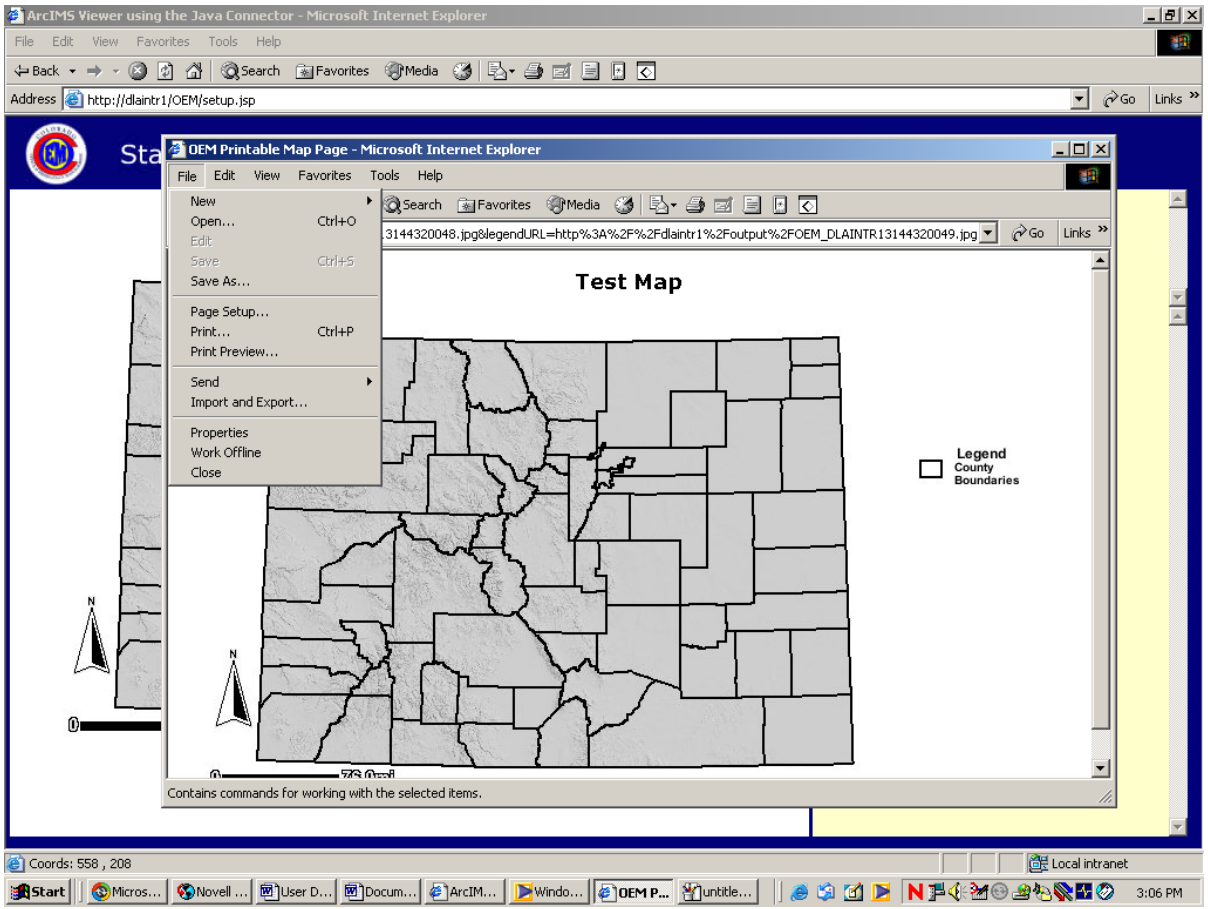
Note: The query builder window remains open after a query is made, though the view window may hide it.

Printable Map Page Tool and Legend Tool

These two tools are the final tools that we'll describe in this user documentation. The ninth icon on the toolbar looks like a printer. Clicking this icon will start the *Printable Map Page Tool*. What will appear will be a dialogue box prompting the user for a map title, as in the first figure on the following page. Entering a title and clicking the OK button will create a map, with a legend displaying all of the layers that are currently active, for the area that the user is zoomed in to, as in the second figure on the following page. The map can be printed or saved as a file at this point.

The *Legend Tool* is the last icon on the toolbar. It is a box with a red 'X" in it. Many features have symbols or color patterns that are hard to understand without reference to a legend which describes the symbol. Clicking on this tool will display a moveable popup window showing a legend of all the layers that are currently turned on. This tool will


ArcIMS Viewer using the Java Connector - Microsoft Internet Explorer
Address http://dlaintr1/OEM/setup.jsp
State of Colorado Office of Emergency Management
Refresh Map
ArcIMS Service Layers
Infrastructure
Demographics
Natural Features / Hazards
Geographic Reference
Images
OEM Printable Map Page - Microsoft Internet Explorer
Enter title for printable map page:
Test Map
OK
Done
Local intranet
Query Builder


ArcIMS Viewer using the Java Connector - Microsoft Internet Explorer
Address http://dlaintr1/OEM/setup.jsp
OEM Printable Map Page - Microsoft Internet Explorer
New
Open... Ctrl+O
Edit
Save Ctrl+S
Save As...
Page Setup...
Print... Ctrl+P
Print Preview...
Send
Import and Export...
Properties
Work Offline
Close
Test Map
Legend
County Boundaries
Contains commands for working with the selected items.
Coords: 558 , 208
Local intranet

need to be closed and re-opened if the layer list is changed, in order to reflect the legend of the current layers.

Finally
This internet based mapping application is an initial attempt to provide rudimentary mapping tools to a wide audience of Emergency Management professionals to assist in answering locationally based questions. It can at times be slow and clunky. During the process of developing this application we have identified a number of enhancements which we intend to implement ASAP. We feel that it is 'good enough' to share with you at this time. It is initially being shared with you with the hope that you will use it, test it and provide constructive feedback to us that will help evolve this application into a more and more user friendly and useful tool.

Please send comments and constructive feedback to Marv Koleis, of the OEM Cartography/Mitigation team at marv.koleis@state.co.us. Feel free to share your thoughts with other members of our team. We know that you won't be shy.